

Table 3-1. (continued).

OU	Site Code	Site Description	FFA/CO Action Proposed	Previous FFA/CO Documentation	Previous Recommen- dations ^a	Status	Eliminate or Retain in OU 10-04 RI/FS ^b	Justification for Retention or Elimination ^c	BRA	ERA
10-03	ORD-15	Experimental Field Station	Track 2/ NTCRA		RI/FS, Institutional Controls	UXO removed during 1996 NTCRA/TNT-soil contamination remains at site/Insti- tutionally Controlled.	Retain	Verified TNT-soil contamination remains at site. Evaluate residual risk	X	X
10-03	ORD-16	UXO East of TRA	Track 2/ TCRA		RI/FS, Institutional Controls	UXO removed during 1996 TCRA. Potential TNT-soil contamination may remain at site/Insti- tutionally Controlled.	Retain	Potential TNT-soil contamination may remain at site. Evaluate residual risk	X	X
10-03	ORD-17	Burn-Ring South of Experimental Field Station	Track 2		RI/FS, Institutional Controls	No UXO found. Potential uncharacterized soil contamination remains within the ring/Institutionally Controlled.	Retain	Potential undetermined soil contamination remains at site. Evaluate residual risk	X	X
10-03	ORD-18	Igloo-Type Structures Northwest of Experimental Field Station	Track 2		RI/FS, Institutional Controls	No UXO found previously, potential for UXO remains/ Institutionally Controlled.	Retain	Evaluate residual risk	X	X

Table 3-1. (continued).

OU	Site Code	Site Description	FFA/CO Action Proposed	Previous FFA/CO Documentation	Previous Recommendations ^a	Status	Eliminate or Retain in OU 10-04 RI/FS ^b	Justification for Retention or Elimination ^c	BRA	ERA
10-03	ORD-19	Rail Car Explosion Area	Track 2/ TCRA/ NTCRA		RI/FS, Institutional Controls	High potential for UXO to remain at site. UXO removed from surface and subsurface during 1996 TCRA and 1997 NTCRA. Removal unfinished/Institutionally Controlled.	Retain	Potential UXO and RDX-soil contamination may remain at site. Evaluate residual risk	X	X
10-03	ORD-20	UXO East of ARVFS	Track 2		RI/FS, Institutional Controls	No UXO found previously, potential for UXO remains/ Institutionally Controlled.	Retain	Evaluate residual risk	X	X
10-03	ORD-21	Juniper Mine	Track 2		RI/FS, Institutional Controls	16,000 lb UXO remain buried 135 ft/ Institutionally Controlled.	Retain	Evaluate residual risk	X	X
10-03	ORD-22	Projectiles Found Near Mile Markers 17 and 19	Track 2/ NTCRA		RI/FS, Institutional Controls	UXO removed 1993 IA and 1994 NTCRA/Institutionally Controlled.	Retain	Evaluate residual risk	X	X
10-03	ORD-23	Rifle Range	Track 2		RI/FS, Institutional Controls	No UXO found previously, potential for UXO remains/ Institutionally Controlled.	Retain	Evaluate residual risk	X	X
10-03	ORD-24	Land Mine Fuze Burn Area	Track 2/ TCRA/ NTCRA		RI/FS, Institutional Controls	UXO removed 1996 TCRA and 1997 NTCRA. Removal unfinished/Institutionally Controlled.	Retain	UXO and potential undetermined soil contamination remain at site. Evaluate residual risk	X	X

Table 3-1. (continued).

OU	Site Code	Site Description	FFA/CO Action Proposed	Previous FFA/CO Documentation	Previous Recommendations ^a	Status	Eliminate or Retain in OU 10-04 RI/FS ^b	Justification for Retention or Elimination ^c	BRA	ERA
10-03	ORD-25	Ordnance & Dry Explosives East of the Big Lost River (This site is the same site as the Rail Car Explosion Area)	NA		NA	NA	Eliminate site Ordnance and Dry Explosives East of the Big Lost River but retain Rail Car Explosion Area Site	The Ordnance and Dry Explosives site East of the Big Lost River and the Rail Car Explosion Area site are the same site		
10-03	ORD-26	Zone East of the Big Lost River	Track 2		RI/FS, Institutional Controls	No UXO found previously, potential for UXO remains/ Institutionally Controlled.	Retain	Evaluate residual risk	X	X
10-03	ORD-27	Dirt Mounds Near the Experimental Field Station, NOAA, and NRF	Track 2		RI/FS, Institutional Controls	No UXO found previously, potential for UXO remains/ Institutionally Controlled.	Retain	Evaluate residual risk	X	X
10-03	ORD-28	Craters East of INTEC	Track 2/ NTCRA		RI/FS, Institutional Controls	UXO removed 1997 NTCRA/ Institutionally Controlled.	Retain	Potential for TNT-soil contamination may remain at site. Evaluate residual risk	X	X
10-03	ORD-29	Big Southern Butte	NA		NA	Appendix N of the OU 10-04 Work Plan (DOE-ID 1999c) documents that no live rounds were fired.	Eliminate	No live rounds were fired	—	—
10-04	STF-01 ^j	STF-601 Sumps and Pits	RI/FS	None	—	New Site; D&D sample FY 1998	Retain	Evaluate risk	X	X
10-04	STF-02 ^j	STF Gun Range	RI/FS	None	—	New site	Retain	Evaluate risk	X	X

Table 3-1. (continued).

OU	Site Code	Site Description	FFA/CO Action Proposed	Previous FFA/CO Documentation	Previous Recommen- dations ^a	Status	Eliminate or Retain in OU 10-04 RI/FS ^b	Justification for Retention or Elimination ^c	BRA	ERA
10-05	—	Ordnance Interim Action (Note: This interim action OU includes OU 4-01)	IA	ROD, Removed Action report, etc.		Evaluated under OU 10-03 as per FFA/CO.	Retain	Evaluate risk	X	X
10-07	—	Tele- communications Cable	IA	Track 1	No Further Action		Retain	Need to Evaluate Ecological risk	—	X

a. Previous decisions considered human health risks only, with the exception of 10-06.

b. It is assumed USTs will not have to be reevaluated per the Resource Conservation and Recovery Act (RCRA) guidance.

c. Further rationale for retaining or eliminating sites for the OU 10-04 ERA can be found in Appendix C1.

d. Further detail for contaminants of potential concern (COPCs) for the OU 10-04 ERA can be found in Appendix C1.

e. The ERA is considered part of the BRA, but it is separated here to identify risk assessment responsibilities. Sites were screened in the preliminary site screening for ecological receptors.

f. GWSCREEN runs will be performed at the WAGs 6 and 10 site level, cumulative GW impacts will be assessed at WAG level for all INEEL WAGs.

g. Material left in place.

h. The Field Sampling Plans (FSPs) in Appendices F, G, and L detail the new data to be collected.

i. New site added since the 1991 FFA/CO.

j. Site codes have been assigned since the 1991 FFA/CO.

EBR = Experimental Breeder Reactor

ARVFS = Army Reentry Vehicle Facility Site

DF = dairy farm

EOCR = Experimental Organic-Cooled Reactor

HTRE = Heat Transfer Reactor Experiment

BORAX = Boiling Water Reactor Experiment

WMO = Waste Management Operations

ZPPR = Zero Power Physics Reactor

LCCDA = Liquid Corrosive Chemical Disposal Area

OMRE = Organic-Moderated Reactor Experiment

CFA = Central Facilities Area

INTEC = Idaho Nuclear Technology and Engineering Center

TNT = trinitrotoluene

TRA = Test Reactor Area

TCRA = Time Critical Removal Action

RDX = Royal Demolition Explosive

STF = Security Training Facility

NOAA = National Oceanic and Atmospheric Administration

NRF = Naval Reactors Facility

FY = fiscal year

ANL-W = Argonne National Laboratory-West

3.2 Overview of WAG 6 Release Sites

WAG 6 consists of sites related to the EBR-I and the nearby BORAX areas. The WAG 6 boundary encompasses both facilities and the immediately adjacent surface and subsurface areas (FFA/CO and Action Plan [DOE-ID 1991]).

The EBR-I complex is in the southwest portion of the INEEL approximately 3.2 km (2 mi) from U.S. Highway 20. The idea for a breeder reactor (a reactor that could produce more fuel than it uses) first occurred to scientists working on the nation's wartime atomic energy program in the 1940s. The large bodies of uranium ore found in the 1950s were unknown then. Because uranium was in very short supply, it was decided that the first power reactor would attempt to prove the theory of fuel breeding. Scientists conducted reactor experiments at EBR-I between 1951 and 1963. The first electricity ever generated from nuclear power occurred at EBR-I on December 20, 1951. In 1953, EBR-I scientists proved that a reactor could create more fuel than it used as it created electricity.

Of the many buildings that once populated the EBR-I complex, only a small guardhouse, the original reactor building, and its office additions remain. Project buildings once included the EBR-I reactor building (EBR-601); two additions to EBR-601, a fuel storage facility, and personnel offices; the Zero Power Reactor No. 3 (ZPR-III) Reactor Training Facility (RTF) Building RTF-601 (later designated Waste Management Operations [WMO]-601); the Argonne Fast Source Reactor (AFSR) shielding building (EBR-605); the sodium potassium (NaK) storage pit; and the NaK disposal pad. Two nuclear jet engines, Heat Transfer Reactor Experiment assemblies (HTRE)-2 and HTRE-3, on display outside the EBR-I perimeter fence were moved from the Aircraft Nuclear Propulsion (ANP) program at TAN to EBR-I in the 1980s. The ANP engines and remaining EBR-I structures are within the cumulative impact range of several EBR-I CERCLA sites, so they will be retained for evaluation under a facility assessment in this RI/FS.

Following its dedication as a Registered National Historic Landmark on August 25, 1966, by President Lyndon Johnson, EBR-I was also dedicated as a National Historic Mechanical Engineering Landmark in 1979 by the American Society of Mechanical Engineers, as a Historic Landmark for Advances in Materials Technology in 1979 by the American Society of Metals, and as a Nuclear Historic Landmark by the American Nuclear Society in 1987. The ANP engines (HTRE-2 and -3) are also part of the National Historic Landmark. The EBR-I reactor building and the HTRE assemblies will be maintained and operated as a National Historic Landmark into the foreseeable future. If circumstances, such as a natural disaster, rule out the preservation of this site, decontamination and decommissioning (D&D) will be scheduled. At that time, although none are expected, it is possible that the previously undiscovered past releases may be discovered during D&D activities.

The BORAX facility, located approximately 1.21 km (0.75 mi) north of the EBR-I facility, was the site of five (BORAX-I, -II, -III, -IV, and -V) reactor experiments conducted between 1953 and 1964. These experiments began with BORAX-I, which was used to demonstrate the feasibility of boiling water reactors. Before this experiment, it had generally been thought that steam formation in a core would result in nuclear instabilities, but the BORAX series conclusively proved that steam actually helped stabilize nuclear reactions. The BORAX-I reactor was intentionally destroyed in 1954 to determine its inherent safety under extreme conditions and afterward was buried in place.

In late 1954, another BORAX facility was constructed a few hundred feet northeast of BORAX-I. Over the next 10 years, three reactors, BORAX-II, -III, and -IV, shared the same reactor vessel in this facility, but the experiments used different fuel designs and core configurations. The BORAX-V reactor used the same facility but used a new reactor vessel and core system. On July 17, 1955, the BORAX-III

reactor gained historical significance as the first nuclear reactor in the world to supply electricity to a community (Arco, Idaho).

The BORAX-II, -III, and -IV reactor fuels and vessel components were dispositioned by Argonne National Laboratory (ANL) personnel at the completion of each respective experiment. Upon completion of the BORAX-V experiments, all the reactor fuel and portions of the internal reactor were removed by ANL-W personnel for dispositioning. Later, several phases of D&D removed all the aboveground structures, stabilized the remaining underground structures, filled the basement with soil, and replaced concrete foundation blocks over the basement.

In the FFA/CO (DOE-ID 1991), WAG 6 is divided into five OUs. Each OU is further divided into release sites (also referred to as subunits). Release sites (or subunits) within these OUs include underground storage tanks (USTs), septic tanks, two reactor burial sites, a leach pond, a trash dump, a drainage ditch, and a radionuclide-contaminated soil area. The extent of existing information and information gaps were identified sufficiently to assign the site to the appropriate track. At WAG 6, the FFA/CO placed each site into either a No Action group with no OU or into one of five OUs (OU 6-01; 6-02; 6-03; 6-04; and 6-05).

Since the first writing of the FFA/CO (DOE-ID 1991), two sites (BORAX-08 and BORAX-09) were identified as WAG 6 concerns. BORAX-08 was identified, and the new unit identification form was sent to the DOE-ID in 1993 (Baumer 1993b). BORAX-09 was identified in a Project Manager (PM) conference call during 1993. Both sites were placed into OU 6-02, but the administrative activities were not completed at that time. A Track 1 decision documentation package for BORAX-09 was signed by the agencies on June 23, 1995, and was placed in the administrative record. During another PM conference call in 1993 the Agencies determined that BORAX-08 would be investigated in the OU 10-06 RI/FS. Subsequently, BORAX-08, along with several other radionuclide contaminated soil sites, was included in the 1995 OU 10-06 non-time critical removal action.

The initial site screening performed in the OU 10-04 Work Plan (DOE-ID 1999c) identified 14 of the WAG-6 release sites to be retained for evaluation in the OU 10-04 RI/FS. The following discussion of WAG 6 sites is organized by OU and includes summaries of the initial screening and the data gaps presented in the OU 10-04 Work Plan (DOE-ID 1999c). Table 3-1 summarizes this information and brings these sites forward.

3.2.1 WAG 6 No Action Sites

Within WAG 6, five sites were designated as “No Action” sites in the FFA/CO (DOE-ID 1991). In general, these were Consent Order and Compliance Agreement (COCA) sites (COCA 1987) that were either found to require no action under the FFA/CO or the determination of No Action was later documented in the administrative record. These sites include EBR-02—EBR-I Septic Tank (AEF-702) and Seepage Pit (AEF-703); EBR-03—the EBR-I Seepage Pit (WMO-702); EBR-04—the EBR-I Septic Tank (WMO-701); EBR-05—the EBR-I Cesspool, Septic Tank (EBR-709), and Seepage Pit (EBR-713); and EBR-06—the EBR-I Septic Tank (EBR-714) and Seepage Pit (EBR-716).

Of these sites, EBR-02, EBR-05, and EBR-06 were eliminated from the OU 10-04 RI/FS. EBR-02 and EBR-06 are septic tanks that were removed, and no source of contamination remains. Therefore, they will remain as “No Action” sites under the FFA/CO. EBR-05 is an active cesspool, septic tank, and seepage pit. Although designated as a “No Action” site under the FFA/CO, it will be retained for the EBR-I facility assessment to be performed in this RI/FS. In 1995, during D&D activities, radionuclide-contaminated sludge was discovered in the EBR-04 tank, and EBR-03 is an associated system. The EBR-04 tank, piping, and contents were removed and disposed of accordingly. Soil samples were

collected from the excavation, but because of the uncertainty in the soil sample data, EBR-03 and EBR-04 will be retained for postremediation evaluation in the RI/FS.

3.2.2 Operable Unit 6-01

Operable Unit 6-01 consists of BORAX-02, which is the BORAX I reactor burial site. This site was remediated and capped in 1996 as part of the OU 5-05/6-01 RI/FS and ROD. The cap covers most of the site's contamination; however, surface soil radionuclide contamination was discovered in 1998 during surveys. Therefore, this site was retained for reevaluation in the OU 10-04 RI/FS.

3.2.3 Operable Unit 6-02

Of the BORAX sites included in this OU, BORAX-03 and BORAX-04 were eliminated from the OU 10-04 RI/FS. The BORAX-03 septic system Track 1 assessment recommended No Action for this site (DOE-ID 1993). The BORAX-03 septic system was removed in 1996 (Rodman 1996). BORAX-04 was a trash dump; however, D&D removed the waste in 1985 (INEL 1993; Paarmann 1993). As part of the Track 1 decision document (DOE-ID 1993), project managers proposed that No Action was appropriate for the site because residual contaminant levels were low. BORAX-01 is the site of the BORAX-II-V Leach Pond. Contamination found in this pond was left in place, and the area was backfilled with clean soil. D&D removed the associated piping in 1992, but no contaminated soil was excavated. During postsampling activities, some subsurface contamination was discovered, so this site was retained in the RI/FS.

BORAX-08 and BORAX-09 are newly identified sites under this OU. The BORAX-08 ditch was included in the OU 10-06 engineering evaluation/cost analysis (EE/CA) (INEL 1995), and a non-time critical removal action (NTCRA) was conducted in 1995. No final OU 10-06 RI/FS document was written, so BORAX-08 was retained for further evaluation in this RI/FS. The document was not finished because as a cost saving measure, the Agencies determined that the OU 10-06 RI/FS would be incorporated into the 10-04 RI/FS. BORAX-09 is composed of BORAX-II, -III, -IV, and -V Reactor Facility (AEF-601/ANL-717). BORAX-09 is retained for evaluation of post D&D (1996) sampling.

3.2.4 Operable Unit 6-03

OU 6-03 consists of ten inactive underground storage tanks that were originally identified as potential release sites. The Track 1 decisions for all ten of the inactive USTs were signed for no further action. Five of these sites were eliminated from the OU 10-04 RI/FS. These five sites include BORAX-05—BORAX fuel oil tank SW of AEF-602; BORAX-07—BORAX inactive fuel oil tank by AEF-601; EBR-07—EBR-I (AEF-704) fuel oil tank at AEF-603; EBR-13—EBR-I gasoline tank (EBR-708) and EBR-14—EBR-I gasoline tank (EBR-717). All five sites had USTs, and all associated contaminated soil was removed. Because of known leaks, EBR-08—EBR-I (WMO-703) fuel oil tank was retained in the OU 10-04 RI/FS for further evaluation of ecological and human health risks. EBR-09—EBR-I (WMO-704) fuel oil tank at WMO-601; EBR-10—EBR-I (WMO-705) gasoline tank; EBR-11—EBR-I fuel oil tank (EBR-706); and EBR-12—EBR-I diesel tank (EBR-707) were retained for further evaluation of ecological risk.

3.2.5 Operable Unit 6-04

OU 6-04 consisted of the EBR-15 radionuclide-contaminated soil comprising four regions surrounding the EBR-601 reactor facility. EBR-15 was included in the OU 10-06 EE/CA (INEL 1995) and a NTCRA was conducted in 1995 under which most of the surface soil was removed. No final OU 10-06 RI/FS was written, so this site was retained for further evaluation in this RI/FS.

3.2.6 Operable Unit 6-05

The FFA/CO (DOE 1991) listed OU 6-05 as the WAG 6 comprehensive RI/FS and cited that it would be incorporated into the OU 10-04 comprehensive RI/FS.

3.3 Overview of WAG 10 Release Sites

WAG 10 includes miscellaneous INEEL sites and the portions of the SRPA outside the other WAGs. WAG 10 also includes the LCCDA; the OMRE leach pond; the sites related to the Experimental Organic-Cooled Reactor (EOCR); the STF sumps, pits, and gun range; and the numerous ordnance areas.

The FFA/CO originally identified 42 release sites under WAG 10, which were divided into one no action OU (i.e., OU none) and five action OUs (i.e., OUs 10-01, 10-02, 10-03, 10-04, and 10-05).

However, since the first writing of the FFA/CO (DOE-ID 1991), additional sites and OUs have been added to WAG 10. Two OUs were added, OU 10-07 and OU 10-06. OU 10-06 was originally developed to assess potential windblown radionuclide-contaminated soil outside the facilities of all the WAGs across the INEEL. Eventually, some radionuclide-contaminated soil areas inside other WAGs were added to OU 10-06. The disposition of the OU 10-06 sites is presented in Section 3.3.7. The OU 10-07 Telecommunications Cable was identified as OU 10-07 under WAG 10 (Baumer 1993a). A signed Track 1 decision document in the administrative record for OU 10-07 contains a “No Further Action” decision determination for human health only. Therefore, OU 10-07 was evaluated for ecological receptors in this RI/FS.

Both STF-01 (Security Training Facility) (STF Sumps and Pits) (Jenkins 1998a) and STF-02 (Gun Range Berm) (Jenkins 1998b) were added to OU 10-04 using the new site identification form (NSIF) process in 1998. Both of these sites were evaluated in the OU 10-04 RI/FS.

The following discussion of WAG 10 sites is organized by OU and includes the initial screening as presented in the OU 10-04 Work Plan (DOE-ID 1999c). Additional sites that have been eliminated from further evaluation in the OU 10-04 RI/FS are also discussed. All of these sites are summarized in Table 3-1, but only the sites that are retained for assessment in OU 10-04 RI/BRA/FS are highlighted.

3.3.1 No Action Sites

Within WAG 10, nine sites that are categorized as not belonging to an OU were designated as “No Action” sites in the FFA/CO (DOE-ID 1991). In general, these were COCA sites (COCA 1987) that require no further action under the FFA/CO or the determination of no further action was later documented in the administrative record. These sites include the Army Reentry Vehicle Facility Site (ARVFS)-01—containers of contaminated NaK; ARVFS-02—ARVFS tank containing low-level radioactive waste; Dairy Farm (DF)-01—the DF Disposal Pit; Experimental Organic-Cooled Reactor (EOCR)-01—the EOCR Leach Pond; EOCR-02—the EOCR Injection Well; EOCR-03—the EOCR Oxidation Pond; EOCR-04—the EOCR Septic Pond; EOCR-05—the EOCR Blowdown Sump (EOCR-719); and Zero Power Physics Reactor (ZPPR)-01 Disposal Pit (outside the ANL-W fence).

Of these sites, ARVFS-01, ARVFS-02, DF-1, EOCR-01, EOCR-02, EOCR-04, EOCR-05, and ZPPR-01 were eliminated from further evaluation. The containers of NaK were removed from ARVFS-01 during a RCRA action in 1995, the ARVFS-01 bunker was demolished in 1996, and the tank was removed from ARVFS-02 and RCRA clean-closed during D&D activities in 1989. No source of contamination remains in either location, and both are no action sites under the FFA/CO. The waste from the DF-01 pit was removed in 1989, and the pit remains inactive. EOCR-01, EOCR-02, and EOCR-05 were never active, and EOCR-04 is currently inactive; no source remains at these sites, and they will continue to be a no action site under the FFA/CO.

The EOCR-03 oxidation pond was designed to receive waste from the EOCR facility. The facility was never completed, and the oxidation pond was never used for the designed purpose. It was classified as a "No Action" site in the administrative record. In the center of the pond are twelve to sixteen 6-ft pieces of 10 to 12-in. concrete piping. Although not identified as a concern in the FFA/CO, a concern that the cement pipe could contain asbestos, and lead was identified in the OU 10-04 Work Plan (DOE ID 1999c). A sample of the concrete analyzed by the industrial hygiene laboratory onsite, using light microscopy with dispersion staining, showed that the piping does not contain asbestos. The concern that the pipe could contain lead was added to the OU 10-04 Work Plan because of an anecdotal report that ion exchange regeneration solutions, potentially including traces of lead, could have been discharged to EOCR-03. However, additional research has shown that no such discharge occurred and lead has been removed as a contaminant of potential concern. This site will not be evaluated further in this RI/FS.

3.3.2 Operable Unit 10-01

This site contains two disposal pits: LCCDA-01, which was operated between 1960 and about 1971, and LCCDA-02, which was operated from about 1970 until the site was closed in 1981 (EG&G Idaho 1986). The LCCDA, which is located approximately 1 km (0.6 mi) east of the main RWMC entrance, was used for the disposal of solid and liquid corrosive chemicals such as nitric acid, sulfuric acid, and sodium hydroxide. This site was retained for evaluation in this RI/FS because of the uncertainty due to the limited number of samples collected for the 1994 and 1995 Track 2 investigation.

3.3.3 Operable Unit 10-02

The OMRE leach pond was used for wastewater disposal from the OMRE reactor. This 12-megawatt thermal [MW(t)] reactor was operated between 1957 and 1963 in the southern portion of the INEEL, approximately 3.2 km (2 mi) east of Central Facilities Area (CFA). Between one and two million gallons of radioactive wastewater, possibly contaminated with organic coolant and decomposition waste, are estimated to have been discharged to the pond. Disposal of the wastewater occurred either through evaporation or infiltration into the ground. The leach pond area underwent D&D in 1978 when it was remediated by excavating some of the more contaminated soil and by filling the pond with clean soil. This site was sampled in 1997, 1999, and 2000 to fill data gaps, and groundwater monitoring will not be completed until at least 2002. This site has been retained for evaluation in this RI/FS.

Because the OMRE was completely demolished by 1980, it is often confused with the adjacent EOCR facility, which remained standing until 1999. The OMRE was a minimum cost test to establish the technical feasibility of the Organic-Moderated Reactor (OMR) concept. The experiment provided much essential information, but its inherent limitations affected the development of a solution to the major problem of fouling of the fuel element surfaces. To complement and later replace the OMRE, the decision was made to proceed with construction of the more adequate EOCR test facility. Construction began on the 40 MW(t) EOCR in 1959, but other OMRs outside the USA limited the need for the EOCR, and the project was canceled at about 90% completion in September 1962. Unlike OMRE, no fuel was ever loaded in the EOCR, and it never operated. Most of the internal system components were removed from EOCR in the early 1960s. The facility sat unused until 1978, when it was used as an office during the D&D of the OMRE. In 1985, the EOCR became a center for security personnel training and was then renamed the STF. Initial D&D of EOCR began in 1998 with the demolition of several small outbuildings, continued in 1999 with the explosive demolition of the main building, and continues in 2000 with the knock down and removal of several levels of basement.

3.3.4 Operable Unit 10-03

Most of the ordnance at the INEEL were deposited during activities conducted at the Naval Proving Ground. The former Naval Proving Ground is currently located within the boundaries of the

INEEL. In 1942, the U.S. Navy acquired 69,808.58 ha (172,494.65 acres) for use as the Naval Proving Ground to test fire 3 to 16-in. diameter Naval ship guns reconditioned at the Naval Ordnance Plant located in Pocatello, Idaho. Between 1942 and 1950, approximately 1,650 minor (3 to 5-in.) and major (16-in.) guns were tested at the Naval Proving Ground. Most of the projectiles were nonexplosive. Additional work at the Naval Proving Ground included experimental and test work, primarily in mass detonations. In 1950, the 69,808.58 ha (172,494.65 acres) that composed the Naval Proving Ground were transferred from the Navy to the AEC for use as a nuclear reactor testing site. During 1968, the Naval Ordnance Test Facility was established at the south end of the former Naval Proving Ground. The Navy used this facility after the Naval Proving Ground had been transferred to the AEC. The Naval Ordnance Test Facility was a temporary facility used to test 16- and 8-inch guns that had been removed from the battleship New Jersey. A more detailed discussion of the ordnance areas and the activities that took place can be found in the Track 2 summary report for OU 10-03 ordnance (DOE-ID 1998).

The OU 10-04 Work Plan (DOE-ID 1999c) identified 29 areas containing ordnance or explosives-contaminated soil and included the Naval Ordnance Disposal Area (NODA). These areas are well defined throughout the INEEL and include two bombing ranges, an area used for mass detonation of explosives, and an area used to test large-caliber guns. Many of these ordnance areas are in or near areas frequented by INEEL personnel. INEEL personnel working in these areas are exposed to the risks associated with uncontrolled detonation of unexploded ordnance (UXO) and soils contaminated with explosive compounds. Walk downs of the ordnance sites occurred during years 1993, 1994, 1995, 1996, 1997, and 2000 in search for UXO. Once an area had been cleared from any UXO, the surface soil was scanned for areas suspected of being contaminated with explosive compounds. The only contaminated soil removal that has taken place was initiated in 1994. This interim action included six of the ordnance areas under OU 10-03. This group of six areas was designated OU 10-05. The interim action is discussed in greater detail in Section 3.3.6 under OU 10-05.

During one of the field seasons (the summer and fall of 1996), a catalog of the UXO found was made. The following provide examples of the types of ordnance that were found:

- Trinitrotoluene (TNT)-contaminated soil at the NOAA grid, the Experimental Field Station, and the Fire Station II areas
- Two live bombs outside of the Experimental Field Station area
- Seven live 13-cm (5-in.) projectiles found outside of the NODA
- One live 80,000-candle power flare found at the Twin Buttes Bombing Range
- Five to six live boosters found at the NOAA grid
- One live land mine and four to five live boosters found at the Mass Detonation Area
- Two live 13-cm (5-in.) projectiles found in the Big Lost River adjacent to the Rail Car Explosion Area
- One live 13-cm (5-in.) projectile found 15 cm (6 in.) belowgrade at the Rail Car Explosion Area
- Seven hundred fuses, eighteen 45-kg (1000-lb) bombs, and several pounds of chunk Royal Demolition Explosives (RDX) and TNT found at the Rail Car Explosion Area.

Twenty-seven of the 29 ordnance areas were retained to be evaluated for the OU 10-04 RI/FS. These sites include Arco High Altitude Bombing Range; Naval Ordnance Test Facility; CFA-633 Naval

Firing Site and Downrange Area; CFA Gravel Pit; CFA Sanitary Landfill Area; NODA; Explosive Storage Bunkers north of INTEC, formerly known as ICPP; Administration NOAA Grid; Twin Buttes Bombing Range; Fire Station II Zone and Range Fire Burn Area; Anaconda Power Line; Old Military Structures; Mass Detonation Area; DF Revetments; Experimental Field Station; unexploded ordnance east of the TRA; Burn Ring South of Experimental Field Station; Igloo-Type Structures northwest of Experimental Field Station; Rail Car Explosion Area (which also includes ordnance and dry explosives in the Big Lost River); unexploded projectiles east of ARVFS; Juniper Mine; projectiles found near Mile Marker 17, 18, and 19; Rifle Range; Land Mine and Fuze Burn Area; Zone East of the Big Lost River; mounds near the Experimental Field Stations, and craters east of INTEC.

3.3.5 Operable Unit 10-04

Operable Unit 10-04 includes the SRPA and two newly identified sites at STF: the STF-601 sumps and pits, and the STF gun range. The STF is located approximately 4 km (2.5 mi) east of the CFA occupying facilities originally built for the EOCR.

In 1997, during an inspection of the STF, the D&D Program discovered the flooded sumps and pits upon opening an area of the basement that had been sealed since approximately 1984. The site (STF-01) was subsequently approved by DOE-ID for addition to OU 10-04 via the NSIF process. Preliminary surveys indicated that there was no radionuclide contamination. Stained water-paths from the ceiling flowed over crumbling asbestos plastered walls and piping. The flooded sumps and pits appeared to contain loose asbestos. It was unknown whether other contaminants were present. Water levels had fluctuated in the sumps and pits as was evident from watermarks on the walls. The STF facility D&D was initiated in 1998 and was completed in the summer of 2000. As part of the D&D removal/abatement, all the water was sampled, filtered, and disposed of. All asbestos was below the drinking water standard; and heavy metals were either nondetects or within the drinking water standard limits. The D&D data from STF-01 have been retained for evaluation in the OU 10-04 RI/FS.

The STF area has been used since 1983 for security force practice maneuvers including small arms target practice in a berm approximately 76 m (250 ft) northeast of STF-601. The berm was used from approximately 1983 to 1990. Approximately five million rounds of ammunition including tracer rounds of ammunition were fired into the berm. The DOE-ID approved the NSIF to add the Gun Range Berm and surrounding soils in the OU 10-04 as STF-02 in the fall of 1997. STF-02 was included as part of the Work Plan and sampled by WAG 10 in the spring of 2000.

Although the SRPA was originally part of OU 10-04, as discussed in Section 1, the SRPA will be evaluated in the OU 10-08 RI/FS. The SRPA is a continuous body of groundwater underlying nearly all the ESRP, portions of which have been affected by INEEL activities. The WAG 10 OU 10-08 groundwater assessment will include the SRPA within the INEEL boundary or beyond, if needed.

3.3.6 Operable Unit 10-05

The OU 10-05 was cited in the FFA/CO (DOE-ID 1991) as the "Ordnance Interim Action." The six sites in OU 10-05 included the CFA Gravel Pit, the Explosive Storage Bunkers north of INTEC, the NOAA Grid, CFA-633 Naval Firing Site and Downrange Area, the Fire Stations II Zone and Range Fire Burn Area, and the Anaconda Power Line. A Record of Decision (ROD) was signed for the interim action sites in 1992 because of their proximity to the INEEL facilities (DOE 1992). An interim action on these six ordnance sites was performed in 1993. The interim action removed UXO and ordnance explosive waste to less than 44 ppm for TNT and less than 18 ppm for RDX. However, portions of CFA-633 and the NOAA grid were not remediated below these levels, because the ROD limit of 141 m³ (185 yd³) of soil had already been removed (Wyle 1994). Although TNT and RDX were the two most commonly used explosives during the World War II era and were considered the chief contaminants at

these sites, traces of other military explosives such as white phosphorus or other contaminants such as metals may also have been present.

During the 1993 interim action, a total of 170 acres were cleared; 130 UXO items were recovered and destroyed, and 60.78 kg (134 lb) of TNT and 47.17 kg (104 lb) of RDX were located and detonated (DOE-ID 1998). The sites covered by this OU are a subset of the ordnance sites evaluated under OU 10-03. All the sites that were evaluated under this OU are discussed further in this RI/FS as indicated in Section 3.3.4.

3.3.7 Operable Unit 10-06

Originally developed to evaluate the potential for windblown radionuclide-contaminated soil around the outside of facilities, OU-10-06 eventually included several areas of nonwindblown radionuclide-contaminated soil inside the facilities. The OU 10-06 sites include the Loss of Fluid Test (LOFT) Windblown Area, Technical Support Facility (TSF) Windblown Area, the TAN sites (TSF-06, TSF-26 and TSF-29), the TRA sites (TRA Windblown Area and North Storage Area [NSA]), the INTEC Windblown Area, the CFA Windblown Area, the Power Burst Facility (PBF) Windblown Area, the EBR-I Windblown Area, the BORAX Windblown Area, the EBR-15 Radionuclide-Contaminated Soil Area, the BORAX Ditch, the BORAX II-V Leach Pond, the RWMC Windblown Area, the ANL-W and Transient Reactor Test Facility (TREAT) Windblown Area, and the ANL-W Soil Stockpile.

The final evaluation of all but five of these sites was completed by the associated WAG as summarized in Table 3-2. The five remaining sites are the BORAX-01 (BORAX-II through V Leach Pond), BORAX-08 (the BORAX ditch), BORAX Windblown, EBR-I Windblown, and EBR-15 radionuclide-contaminated soil area. The EBR-I and BORAX windblown areas were assessed for risks to both human and ecological receptors in the EE/CA for OU 10-06 Radionuclide Contaminated Soils Removal Action at the INEEL (INEL 1995). These windblown areas were limited to the surface soil outside the administratively controlled area and within the outermost EMI (EG&G Energy Measurements, Inc.) 1990 aerial survey isopleths (EMI 1992).

The BORAX windblown area was assessed in Section 13 of the EE/CA (INEL 1995). The human health risk and ERA results indicated that it was unlikely that exposure to the contaminants of potential concern (COPCs) at the BORAX Windblown Area would cause adverse effects to human populations or exposed ecological receptors. Therefore, this release site was not evaluated further in this RI/FS.

The EBR-I windblown area assessment was presented in Section 14 of the EE/CA (INEL 1995). Two types of information were available to this assessment: soil sampling and the Phase I dose equivalent rate measurements collected using a mircorem meter. The results of the assessment indicate that exposure to soil at the concentrations detected was unlikely to cause an adverse effect to either human populations or exposed ecological receptors. However, the dose equivalent rate measurements indicated possible risk from external exposure to human and ecological receptors. The measurement results (verified by the soil sampling results) indicated that the elevated exposure rate in this area was a result of radioactivity associated with the large nuclear jet engines from the ANP Program displayed outside the EBR-I perimeter fence. These engines were assessed as part of the EBR-I facility assessment in Section 7. The engines are not a CERCLA site and the elevated exposure rate originating from them is not included in the EBR-I Windblown Area risk assessment. The BORAX ditch (BORAX-08), BORAX Leach Pond (BORAX-09), and EBR-15 are the remaining sites identified under OU 10-06 that were evaluated in this RI/FS.

Table 3-2. Site descriptions and dispositions for OU 10-06.

OU	Site	Description of Disposition and Agency Decision	Date	Decision Document
10-06	LOFT (Loss-of-Fluid Test) Windblown	The source of the windblown contamination (LOFT-02) was addressed under the Record of Decision (ROD) as a no action site; however, the windblown contamination areas were not. The engineering evaluation/cost analysis (EE/CA) (INEL 1995) evaluated this area and found no radionuclides above background.	12/14/99 06/01/95	ROD DOE/ID-10682 INEL-95/0259
10-06	Technical Services Facility (TSF) Windblown	The sources of the windblown contamination (TSF-06, TSF-26, and TSF-29) were addressed under the ROD; however, the windblown contamination areas were not. The EE/CA (INEL 1995) evaluated this area and found that radionuclide concentrations were below remedial action objectives, and there were no ecological receptors.	12/14/99 06/01/95	ROD DOE/ID-10682 INEL-95/0259
1-05	Test Area North (TAN)/TSF-06	TAN/TSF-06 radioactive soil area (TSF-06 Area B) was remediated under OU 10-06, but portions are currently WAG 1 remedial action sites.	12/14/99	ROD DOE/ID-10682 (DOE-ID 1999a)
1-05	TAN/TSF-26	Site was partially remediated under OU 10-06 and is a WAG 1 remedial action site.	12/14/99	ROD DOE/ID-10682 (DOE-ID 1999a)
1-05	TAN/TSF-29	This site was evaluated under OU 10-06 and designated as No Further Action; it will be addressed under WAG 1 institutional controls.	12/14/99	ROD DOE/ID-10682 DOE-ID 1999a)
10-06	Test Reactor Area (TRA) Windblown	This site was analyzed in the OU 10-06 EE/CA (INEL 1995). The radionuclide contamination levels are below the recommended remediation action objective. Therefore, the site was deemed to need no further action.	12/22/97 06/01/95	ROD DOE/ID-10586 (DOE-ID 1997) INEL-95/0259
2-04	TRA North Storage Area (NSA) (TRA-34)	The remediation completed under OU 10-06 resulted in acceptable risks to human health and the environment.	12/22/97	ROD DOE/ID-10586 (DOE-ID 1997)
10-06	INTEC Windblown	This site was evaluated under OU 10-06 and was designated as No Further Action and will be addressed under WAG 3 institutional controls.	10/07/99	ROD DOE/ID-10660
10-06	Central Facilities Area (CFA) Windblown	This site was evaluated under OU 10-06 and is a WAG 4 remedial action site.	07/31/00	ROD DOE/ID-10719

Table 3-2. (continued).

OU	Site	Description of Disposition and Agency Decision	Date	Decision Document
10-06	Power Burst Facility (PBF) Windblown	Four locations of potential windblown contamination were evaluated under OU 10-06 (SPERT-I, SPERT-II, WERF/SPERT-III, and SPERT-IV). The results of the OU 10-06 EE/CA risk assessment (INEL 1995) indicate that external exposure was the only pathway of concern at SPERT-IV due to the proximity of cargo containers behind the mixed waste storage facility. This concern was evaluated in the co-located facility assessment performed in the OU 5-12 RI/FS (DOE-ID 1999d).	01/01/99	Waste Area Group 5 Operable Unit 5-12 Comprehensive Remedial Investigations/Feasibility Study (RI/FS) (DOE-ID 1999d)
10-06	EBR-I Windblown	This site was evaluated in the OU 10-06 EE/CA (INEL 1995), and results indicate that windblown soil contamination is unlikely to be a concern to human or ecological receptors. See Section 3.3.7	06/01/95	INEL-95-0259
10-06	BORAX Windblown	This site was evaluated in the OU 10-06 EE/CA (INEL 1995), and results indicate that site is unlikely to be a concern to human or ecological receptors. See Section 3.3.7.	06/01/95	INEL-95-0259
6-04	EBR-15	This site was remediated under OU 10-06, and the results were reviewed in this RI/FS.	04/01/99	Work Plan for the OU 10-04 RI/FS DOE/ID-10554
6-02	BORAX Ditch (BORAX-08) Nonwindblown	This site was remediated under OU 10-06, and the results were reviewed in this RI/FS.	04/01/99	Work Plan for the OU 10-04 RI/FS DOE/ID-10554
6-02	BORAX II-V Leach Pond (BORAX-01)	This site was evaluated under OU 10-06 and will be reviewed in this RI/FS.	04/01/99	Work Plan for the OU 10-04 RI/FS DOE/ID-10554
10-06	RWMC Windblown	This site was evaluated under OU 10-06 and will be evaluated in the OU 7-13 and 7-14 RI/FS.	05/01/96	Work Plan for the OU 7-13 & 7-14 RI/FS INEL-95/0343
10-06	ANL-W and TREAT Windblown	The evaluation under OU 10-06 of this site showed no unacceptable risks, and this site was designated as a no action site.	09/29/98	ROD W7500-000-ES-04
10-06	ANL-W Stockpile	The site was remediated under OU 10-06 and evaluated under the OU 9-04 RI/FS, and the risks associated with this site are within the <i>National Oil and Hazardous Substances Contingency Plan</i> (NCP) target risk range.	09/29/98	ROD W7500-000-ES-04
TREAT = Transient Reactor Test Facility INTEC = Idaho Nuclear Technology Engineering Center ANL-W = Argonne National Laboratory – West				
SPERT = Special Power Excursion Reactor Test BORAX = Boiling Water Reactor Experiment EBR = Experimental Breeder Reactor			WERF = Waste Experimental Reduction Facility RWMC = Radioactive Waste Management Complex	

3.3.8 Operable Unit 10-07

The U.S. West buried telecommunications cable was installed by AT&T in the early 1950s. The cable has a diameter of approximately 5 cm (2 in) and consists of copper wiring and paper insulation that is enclosed by a lead sheath approximately 0.32 cm (1/8 in.) thick. The lead is wrapped in spiraled steel and enclosed in jute wrapping that is impregnated with an asphalt-like substance. The 58.7 km (36.5 mi) long cable was buried approximately 0.9 to 1.2 m (3 to 4 ft) belowgrade, parallel to and approximately 91 m (100 yd) east of Lincoln Boulevard at the INEEL. The cable originates at the CFA and extends along Lincoln Boulevard to the INTEC, TRA, NRF, and TAN. The cable was cut and rendered useless in the spring of 1990 when U.S. West installed a new fiber optic replacement cable. The cable was identified as a new CERCLA site in 1993 (Baumer 1993a). Soil samples collected in November 1990 indicated that no risk to human health was present, and the potential for release of contaminants from the cable in the future is expected to be very small. OU 10-07 is classified as a "No Further Action" site in the administrative record (DOE-ID 1994). This site will not be evaluated further for human health risk in the OU 10-04 RI/FS. It will be retained in the RI/FS for evaluation of risk to ecological receptors.

3.4 Facility Assessment Sites

The OU 10-04 Work plan (DOE-ID 1999c) facilities screening process was performed for operational facilities, facilities no longer being used for their original mission, and abandoned or demolished facilities. The *Comprehensive Facility Land Use Plan* (DOE-ID 1996) was used to identify all buildings and structures in WAGs 6 and 10. The screening process determined whether non-FFA/CO identified releases had either occurred or could occur from these facilities. The screening process eliminated nearly all facilities in WAGs 6 and 10. However, the eliminated sites may be subject to performance standards that take effect under the OU 10-04 ROD. The performance standards ensure the sites will not pose an unacceptable cumulative risk following closure.

The results of the screening process (DOE-ID 1999c) indicated that the following facilities should be evaluated for the potential impact on cumulative risk:

- EBR-I Reactor Facility (EBR-601/601A) and area structures
- STF.

The facility assessment for EBR-I is included as Section 6 of this RI/FS. The STF was eliminated from this assessment. The STF D&D was initiated in 1998 and sampled in the spring of 2000. The final report of this activity is due in early 2001. Based on current D&D practices no hazards should remain.

3.5 CPP-66 Fly Ash Pit

CPP-66 is the site of a pit used for disposal of ash generated by the ICPP Coal-Fired Steam Generation Facility (CFSGF), designated CPP-687. The CFSGF complex is a 229 × 137-m (750 × 450-ft) enclosure containing several buildings located southeast of the main INTEC security fence. Since 1984, the CFSGF has been generating about 1,000 tons of ash per year. This ash is hydrated and placed into CPP-66, located due east of CFSGF. CPP-66 is approximately 244 × 122 × 3.4 m (800 × 400 × 11 ft) in size. The original ash pit built in 1984 had a capacity of 53,500 m³ (70,000 yd³) in 1991. It was enlarged to a total volume of 120,000 yd³.

The OU 3-13 Final ROD (DOE-ID 1999b) states that "CPP (Steam Fly Ash Pits) presents only a potential ecological risk and will be addressed under the CERCLA OU 10-04, which focuses on

INEEL-wide ecological risk concerns.” Consequently, CPP-66 was retained as a site of potential concern for ecological risk in the OU 10-04 Work Plan (DOE-ID 1999c). The site was evaluated for metals and radionuclides in surface and subsurface soil. The assessment was performed using the results of a previously conducted screening level ERA and the same basic methodology developed in the *Guidance Manual for Conducting Screening Level Ecological Risk Assessments at the INEL* (VanHorn et al. 1995). The WAG 3 ERA in the OU 3-12 found CPP-66 to have hazard quotients (HQs) greater than 1.0 from estimated concentrations of boron, fluoride, selenium, and strontium.

In 2000, data were collected from CPP-66 (the Fly Ash Pit) to provide actual data for evaluation of risk to ecological receptors. This activity is documented in Appendix J.

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